

LA-UR-18-26928

Approved for public release; distribution is unlimited.

Title: Smart Lab Renovation in TA-35-0213

Author(s): Haagenstad, Julia Marie
Collins, Adam Paul
Williams, Tamia
Ramirez, Maricella Crystal
Cuevas, Morelia Annette
Bennett, William Ira
Anaya, Lauryn Anne
Baca, Marissa Terese
Montoya, Ryan Nicholas

Intended for: Symposium

Issued: 2018-07-25

Disclaimer:

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the Los Alamos National Security, LLC for the National Nuclear Security Administration of the U.S. Department of Energy under contract DE-AC52-06NA25396. By approving this article, the publisher recognizes that the U.S. Government retains nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.

Abstract

For this project, the PADCAP student based integrated project team (IPT) is following the Smart Lab Initiative created by University of California Irvine (UCI). The IPT will be working on implementing this program into TA 35-0213 (Target Fab). Target Fab crucially requires upgrades for the continuation of critical mission work conducted within its walls. By analyzing fume hoods, the IPT hopes to improve the facility by making energy efficiency decisions.

Smart Lab Components

BAS

1. Fundamental platform of dynamic, digital control systems.
2. Commissioning with automated cross platform fault detection.

HVAC

3. Demand-based ventilation.
4. Exhaust fan discharge velocity optimization.
5. Pressure drop optimization.
6. Fume hood flow optimization.

Lighting

7. Low power density, demand based lighting.

TA-35-0213 Smart Lab Upgrade Phases

1: Maintenance on ventilation systems

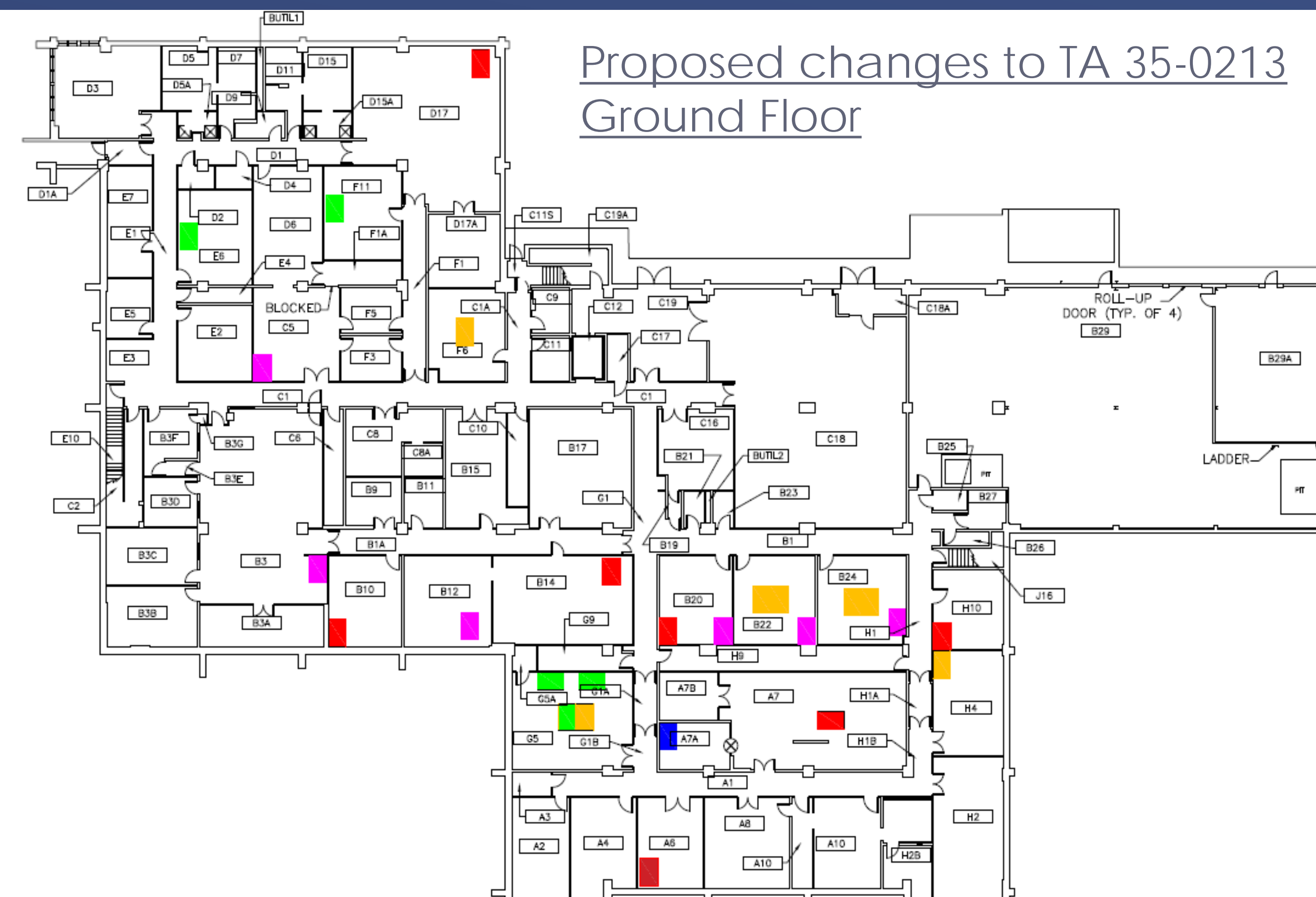
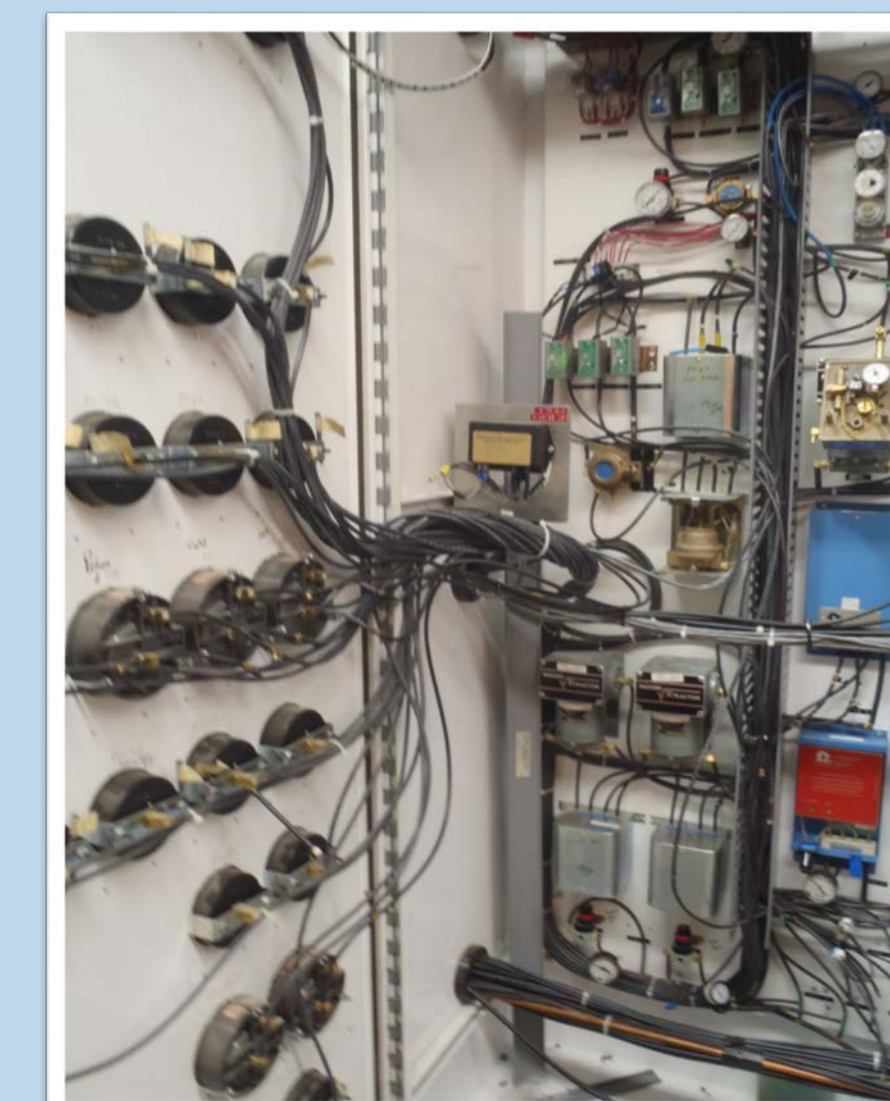
2: BAS upgrades

3: Chiller and condenser upgrades

4: Fume hood upgrades

Current Fume Hood Conditions

- 41 Total Fume Hoods on an old BAS
- 24 Failed and/or unused fume hoods.
→ Lined with asbestos and legacy waste.
- 19 Outdated auxiliary fume hoods:
→ Blows untampered outside air in front of fume hood.
→ Constant Air Volume wastes energy.



- Red indicates fume hoods to be removed
- Green indicates fume hoods to be kept
- Orange indicates fume hoods to be retrofitted
- Blue indicates fume hoods to hibernate
- Magenta indicates fume hoods to be replaced

Upgrades

Upgrades to Target Fab will include removal and installation of new fume hoods as well as hibernating or retrofitting fume hoods in order to decrease the buildings energy consumption.

Fume hoods being Removed: 23
Fume hoods being Hibernated: 1
Fume hoods being Retrofitted: 7
Fume hoods being installed: 16

Rough Order of Magnitude (ROM):

\$20.3 Million

Total Lost Productivity

Due to an estimated total of 20 fume hoods not being used is resulting in a estimated total of **\$2.5 Million** in lost productivity per year

Acknowledgements

Special thanks to: Lynne Clarkson, Monica Witt, Cindy Dilworth, Genna Waldvogel, Sonia Rodriguez, Yvonne Wood, Karen Borovina, Scottie Richardson, Deborah McClard, Michael Trujillo, Myra Stafford, Paul Blumberg, Evan Schmidt, Vincent Bauer, Aaron Hobson, Jeff Fredenburg, Gary Goddard, Joe Klose, and Chris Baca.